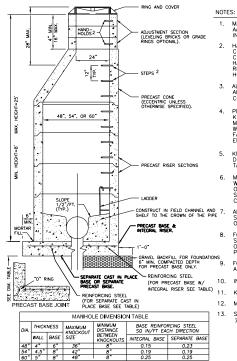
1. THIS FRAME IS DESIGNED TO ACCOMODATE 20"x 24" GRATES OR COVERS AS SHOWN ON STD. PLANS D4.2 AND D4.3.

2. WHEN BOLT DOWN GRATES OR COVERS ARE SPECIFIED, PROVIDE TWO HOLES IN THE FRAME THAT ARE VERTICALLY ALIGNED WITH THE GRATE OR COVER SLOTS. TAP EACH HOLE TO ACCEPT A 5/8" $Z^{\prime\prime}=1$ 1 no Callen Head CAP SCREW. LOCATION OF BOLT DOWN HOLES VARIES AMONG DIFFERENT MANUFACTURERS.

3. REFER TO WSDOT STANDARD SPECIFICATION 9-05.15(2) FOR ADDITIONAL REQUIREMENTS

4 SEE WSDOT STD SPEC SECTION 7.05

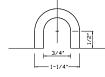
REVERSIBLE FRAME FOR CATCH BASIN



- IN THE WADDI/ARM STANDARD SPECIFICATIONS.

 HANDHOLDS IN ADJUSTMENT SECTION SHALL HAVE 3" MIN. CLEARANCE. STEPS IN MANHOLE SHALL HAVE 6" MIN. CLEARANCE. SEE PLAN NO. 01.5. "MANHOLE DETAILS." HANDHOLDS SHALL BE PLACED IN "ALTERNATING GRADE RINGS OR LEVELING BRICK COURSE WITH A MIN. OF ONE HANDHOLD BETWEEN THE LAST STEP AND THE TOP OF THE MANHOLE.
- ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000 ALL PRECAST CONCRETE SHALL BE CLASS 4000. NON-REINFORCED CONCRETE IN CHANNEL AND SHELF SHALL BE CLASS 3000.
- PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. SHALL HAVE WALL THICKNESS OF 2" MICHAEL THICKNESS OF 2" MICHAEL THICKNESS OF 2" MICHAEL SHALL SH
- MANHOLE RINGS AND COVERS SHALL BE IN ACCORDANCE WITH SEC. 7.05 AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RRF-F621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
- FOR HEIGHTS OF 12' OR LESS, MIN. SOIL BEARING VALUE SHALL EQUAL 3,300 POUNDS PER SQUARE FOOT. FOR HEIGHTS OVER 12', MIN. SOIL BEARING VALUE SHALL EQUAL 3,800 POUNDS PER SQUARE FOOT.
- FOR DETAILS SHOWING GRADE RING, LADDER, STEPS, HANDHOLDS AND TOP SLABS, SEE PLAN NO. D1.5, "MANHOLE DETAILS." INSIDE DROP MAXIMUM TO BE 4' VERTICAL DISTANCE I.E. TO I.E. KNOCKOUTS TO BE USED WHEN STUB OUT PIPE IS 3' OR LESS. 12. MINIMUM 0.20' FALL BETWEEN INLET AND OUTLET
- SEE THE WSDOT/APWA STANDARD SPECIFICATIONS SEC. 7-05.3 FOR JOINT REQUIREMENTS.

- SEE SLOT DETAIL & NOTE



SLOT DETAIL

NOTES

1. WELDING NOT PERMITTED

2. USE VANED GRATE PER STD. PLAN D4.3 WHERE LONGITUDINAL SLOPE EXCEEDS 4%.

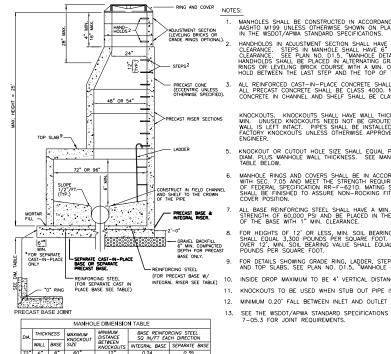
3. WHEN BOLT DOWN GRATES ARE SPECIFIED, PROVIDE TWO SLOTS IN THE GRATE THAT ARE VERTICALLY ALIGNED WITH THE HOLES IN THE FRAME. LOCATION OF BOLT DOWN SLOTS VARIES AMONG DIFFERENT MANUFACTURERS.

4. REFER TO WSDOT STANDARD SPECIFICATION 9-05.15(2) FOR ADDITIONAL REQUIREMENTS.

5. FOR FRAME DETAIL, SEE STD. PLAN D4.1

THE THICKNESS OF THE GRATE SHALL NOT EXCEED 1-5/8".

HERRINGBONE GRATE FOR CATCH BASIN



MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M199 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS.

HANDHOLDS IN ADJUSTMENT SECTION SHALL HAVE 3" MIN.
CLEARANCE. STEPS IN MANHOLE SHALL HAVE 6" MIN.
CLEARANCE. SEE PLAN NO. D.1.5, "MANHOLE DETAILS."
HANDHOLDS SHALL BE PLACED IN 'ALTERNATING GRADE
RINGS OR LEVELING BRICK COURSE WITH A MIN. OF ONE HAND
HOLD BETWEEN THE LAST STEP AND THE TOP OF THE MANHOLE. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000 ALL PRECAST CONCRETE SHALL BE CLASS 4000. NON-REINFORCED CONCRETE IN CHANNEL AND SHELF SHALL BE CLASS 3000.

KNOCKOUTS. KNOCKOUTS SHALL HAVE WALL THICKNESS OF 2" MIN. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LET! INTACT. PIPES SHALL BE INSTALLED ONLY IN FACTORY KNOCKOUTS UNLESS OTHERWISE APPROVED BY THE ENGINEER.

KNOCKOUT OR CUTOUT HOLE SIZE SHALL EQUAL PIPE OUTER DIAM. PLUS MANHOLE WALL THICKNESS. SEE MANHOLE DIMENSION TABLE BELOW.

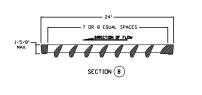
MANHOLE RINGS AND COVERS SHALL BE IN ACCORDANCE WITH SEC. 7.05 AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RRF-F621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.

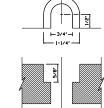
ALL BASE REINFORCING STEEL SHALL HAVE A MIN. YIELD STRENGTH OF 60,000 PSI AND BE PLACED IN THE UPPER HALF OF THE BASE WITH 1" MIN. CLEARANCE.

 FOR HEIGHTS OF 12' OR LESS, MIN. SOIL BEARING VALUE SHALL EQUAL 3,300 POUNDS PER SQUARE FOOT. FOR HEIGHTS OVER 12', MIN. SOIL BEARING VALUE SHALL EQUAL 3,800 POUNDS PER SQUARE FOOT. FOR DETAILS SHOWING GRADE RING, LADDER, STEPS, HANDHOLDS, AND TOP SLABS, SEE PLAN NO. D1.5, "MANHOLE DETAILS."

- 10. INSIDE DROP MAXIMUM TO BE 4' VERTICAL DISTANCE I.E. TO I.E. 11. KNOCKOUTS TO BE USED WHEN STUB OUT PIPE IS 3' OR LESS.
- 13. SEE THE WSDOT/APWA STANDARD SPECIFICATIONS SEC. 7-05.3 FOR JOINT REQUIREMENTS.

SECTION (A) PLAN VIEW





SLOT DETAIL

NOTES

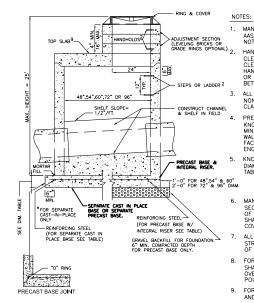
1. WELDING NOT PERMITTED

2. USE HERRINGBONE GRATE PER STD. PLAN D4.2 WHERE LONGITUDINAL SLOPE IS LESS THAN 4%.

4. REFER TO WSDOT STANDARD SPECIFICATION 9-05.15(2) FOR ADDITIONAL REQUIREMENTS.

5. FOR FRAME DETAIL, SEE STD. PLAN D4.1

VANE GRATE FOR CATCH BASIN



MANHOLE DIMENSION TABLE

| THICKNESS | MAXIMUM | BASE REINFORCING STEEL | NISTANCE | SO IN/FT EACH DIRECTION | WALL | BASE | SEPARTE BILL | SIZE | MINIMUM | MINIMUM | SIZE | SIZE | SIZE | MINIMUM | SIZE | SIZE

1 MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M199 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS. NOTED IN THE WISDOT/APPWA STANDARD SPECIFICATIONS.

HANDHOLDS IN ADJUSTMENT SECTION SHALL HAVE 3" MIN.
CLEARANCE. STEPS IN MANHOLE SHALL HAVE 6" MIN.
CLEARANCE. SEE PLAN DIS. "WANHOLE DETAILS."
HANDHOLDS SHALL BE PLACED IN ALTERNATING GRADE RINGS
OR LEVELING BRICK COURSE WITH A MIN. OF DIE HANDHOLD
BETWEEN THE LAST STEP AND THE TOP OF THE MANHOLE. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS4000. NON-REINFORCED CONCRETE IN CHANNEL AND SHELF SHALL BE CLASS 3000. ALL PRECAST CONCRETE SHALL BE CLASS 4000.

PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE WALL THICKNESS OF 2" MIN. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT. PIPES SHALL BE INSTALLED ONLY IN FACTORY KNOCKOUTS UNLESS OTHERWISE APPROVED BY THE ENGINEER.

KNOCKOUT OR CUTOUT HOLE SIZE SHALL EQUAL PIPE OUTER DIAM. PLUS MANHOLE WALL THICKNESS. SEE MANHOLE DIMENSION TABLE BELOW.

MANHOLE RINGS AND COVERS SHALL BE IN ACCORDANCE WITH SEC. 7.05 AND MEET THE STRENGTH REQUIREMENTS
OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES
SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY
COVER POSITION.

ALL BASE REINFORCING STEEL SHALL HAVE A MIN. YIELD STRENGTH OF 60,000 PSI AND BE PLACED IN THE UPPER HALF OF THE BASE WITH 1" MIN. CLEARANCE.

- FOR HEIGHTS OF 12' OR LESS, MIN. SOIL BEARING VALUE SHALL EQUAL, 3,300 POUNDS PER SQUARE FOOT. FOR HEIGHTS OVER 12', MIN. SOIL BEARING VALUE SHALL EQUAL 3,800 POUNDS PER SQUARE FOOT.
- 10. INSIDE DROP MAXIMUM TO BE 4' VERTICAL DISTANCE I.E. TO I.E. 11. KNOCKOUTS TO BE USED WHEN STUB OUT PIPE IS 3' OR LESS.
- 12. MINIMUM 0.20' FALL BETWEEN INLET AND OUTLET
- SEE THE WSDOT/APWA STANDARD SPECIFICATIONS SEC. 7-05.3 FOR JOINT REQUIREMENTS.

MANHOLE TYPE 3 48", 54", 60", 72" & 96"

MANHOLE TYPE 1 48", 54" & 60"

MANHOLE TYPE 2 72" & 96'



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